Enclosure A

Amendment to New Hampshire 2010 Sulfur Dioxide NAAQS Infrastructure SIP to Address the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I)

June 16, 2017

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Revision to the

New Hampshire
State Implementation Plan

Amendment to New Hampshire 2010 Sulfur Dioxide NAAQS Infrastructure SIP to Address the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I)

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INTRODUCTION

Sections 110(a)(1) and (2) of the Clean Air Act (CAA) require states to submit a State Implementation Plan (SIP) amendment that addresses the procedural, timing and infrastructure elements identified in those sections within three years of promulgation of a new National Ambient Air Quality Standard (NAAQS). On June 2, 2010, EPA strengthened the primary NAAQS for sulfur dioxide (SO_2) by promulgating a revised standard based on 1-hour average concentrations. EPA set the new 1-hour SO_2 NAAQS at the level of 75 parts per billion (ppb). At an ambient air quality monitoring site, compliance with the standard is achieved when the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations is less than or equal to 75 ppb. In setting the new NAAQS, EPA also revoked both the existing 24-hour and annual primary SO_2 standards, subject to certain conditions.

BACKGROUND

New Hampshire Department of Environmental Services (NHDES) submitted its "Certification of State Implementation Plan Adequacy Regarding Clean Air Act Section 110(a)(1) and (2) for the 2010 1-Hour Sulfur Dioxide Standard" (also referred to as an infrastructure SIP or iSIP) to the EPA as a SIP amendment in September 2013. In its July 2016 Final Rule (81 FR 44542), the EPA certified that the SIP was sufficient to meet the required infrastructure elements under sections 110(a)(1) and (2) for the 2010 SO_2 NAAQS, with the exception of certain aspects relating to the state's Prevention of Significant Deterioration (PSD) program relating to notification of neighboring states, which was provisionally approved. The interstate transport provision, Section 110(a)(2)(D)(i)(I), was not addressed in the iSIP, and EPA took no action other than to state "...New Hampshire's and EPA's obligations regarding interstate transport for the 2010 SO_2 NAAQS will be addressed in later rulemakings."[1] NHDES addressed the PSD aspect in a rule revision that was submitted as a SIP amendment in October 2016. Interstate transport is addressed in this amendment.

AIR QUALITY MONITORING IN NEW HAMPSHIRE

The State of New Hampshire currently monitors SO_2 at five locations as shown in Table 1 and Figure 1.

Table 1. New Hampshire SO_2 Air Monitoring Stations Network

Town	Name	AIRS #	Frequency
Londonderry	Moose Hill School	33 015 0018	Continuous
Pembroke	Pembroke Highway Dept.	33 013 1006	Continuous
Peterborough	Pack Monadnock	33 011 5001	Continuous
Portsmouth	Pierce Island	33 015 0014	Continuous
Concord	Hazen Drive	33 013 1007	Continuous

[1] 81 FR 44542

Figure 1. **SO_2 Monitoring Locations in New Hampshire**

1. **Concord**
6. **Londonderry**
8. **Pembroke**
9. **Peterborough**
10. **Portsmouth**

Existing SO_2 monitoring indicates that these areas have SO_2 concentrations that are below the 2010 1-hour primary SO_2 NAAQS, as shown in Table 2.

Table 2. SO_2 Annual 99th Percentile ($P_{0.99}$) and Design Values (ppb): 2013 -2015

Location	Site ID	2013	2014	2015	Design Value
Concord	33-013-1007	9	10	7	8.7
Londonderry	33-015-0018	5	5	6	5.3
Pembroke	33-013-1006	17	26	17	20
Peterborough	33-011-5001	5	5	3	4.3
Portsmouth	33-015-0014	31	32	23	28.7
Data from https://www.epa.gov/outdoor-air-quality-data					

Based on the most recent three year period of quality assured data subsequent to the NAAQS revision (2009-2011), the air quality measured at the Pembroke Station did not meet the standard. Therefore, in accordance with Clean Air Act Section 107(d)(1)(A), in July 2011 New Hampshire submitted its designation recommendation and supporting information to designate 13 towns and 1 city located in three counties as the New Hampshire nonattainment area for the revised SO_2 NAAQS.[2] In addition to air quality data, emissions data, topography and meteorological data were evaluated. Since that designation, the state's largest source of SO_2 emissions, Eversource Energy's Merrimack Station located in Bow, has installed a flue gas desulfurization system. That, combined with emission limits imposed in the stations recent Temporary Permit (TP-0189) issued on September 1, 2016, will result in current and future attainment of the SO_2 standard. NHDES submitted a nonattainment plan in February 2017 that includes specific permit conditions and will request the redesignation of the area to attainment later this year.

In addition, NHDES has submitted a designation recommendation for the remaining portions of the state as "attainment," and "attainment/unclassifiable." The areas identified as "attainment/unclassifiable" included Belknap, Carroll, Cheshire, Coos, Grafton and Sullivan Counties, and undesignated portions of Merrimack and Hillsborough Counties. "Attainment" status was recommended for Strafford County and undesignated portions of Rockingham County. The latter designation recommendation was based on the results of an air dispersion modeling analysis conducted in accordance with the Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS) [80 FR 51052], that primarily focused on two facilities in Rockingham County (Eversource Newington and Schiller Stations) that have the potential to emit more than 2,000 tons per year.[3] The results of ambient monitoring and air dispersion modeling analysis indicate that the area is in attainment with the revised standard through the establishment of federally enforceable permit conditions contained in Temporary Permit (TP-0197) issued to Eversource Newington

[2] The Central New Hampshire Nonattainment Area was established by EPA on August 5, 2013 in concurrence with New Hampshire's recommendation (78 FR 47191).
[3] Wright, Craig. December 13, 2016. Letter to H. Curtis Spaulding, Administrator, EPA Region1, Re: Designation of Attainment/Attainment-Unclassifiable for the 2010 SO_2 NAAQS for portions of New Hampshire.

Station on December 22, 2016 and the final Title V Operating Permit (TV-0053) issued to Eversource Schiller Station on June 15, 2017.

As described in the Data Requirements Rule submittal, Eversource Schiller and Newington Stations were modeled for five meteorological years (2010-2014) along with selected background sources using the current version of AERMOD (v16216r). The modeling used allowable emissions for Schiller and Newington Stations and five recent calendar years of available processed meteorological data (2010-2014) to establish the area attainment designation with respect to the 1-hour NAAQS for SO_2. The five-year averaged, 4th high, maximum daily, one-hour SO_2 predicted concentrations at all receptors for Schiller Station at 100%, 75%, and 50% loads are in compliance with the NAAQS value of 75 parts per billion (ppb) as shown in Table 3.

Table 3. Schiller and Newington Station Modeling: 5-yr Average 4th-High Maximum Daily 1-hour SO_2 Predicted Concentrations[4]

Pollutant and Averaging Period	Schiller Station Load	Schiller Station Contribution (ppb)	Newington Station Contribution (ppb)	Monitored Background Contribution (ppb)	Total Concentration (ppb)	NAAQS (ppb)
SO_2 1-hour	100%	48.9	22.8	3.1	74.8	75
	75%	47.6	17.7	2.3	67.6	
	50%	58.5	0.3	3.1	61.9	

SO_2 SOURCES IN NEW HAMPSHIRE

Table 4 identifies total county emissions from all point sources, and largest point sources for the years 2013-2015. No New Hampshire sources emit more than 2,000 tons of SO_2 per year. Ambient air monitoring, air dispersion modeling and/or federally enforceable permit limitations on certain sources identified as requiring further characterization in accordance with the Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS) [80 FR 51052] indicate that the NAAQS will be met in these counties.[5]

Table 4. Total County SO2 Emissions and Large County Source (>10 tpy)

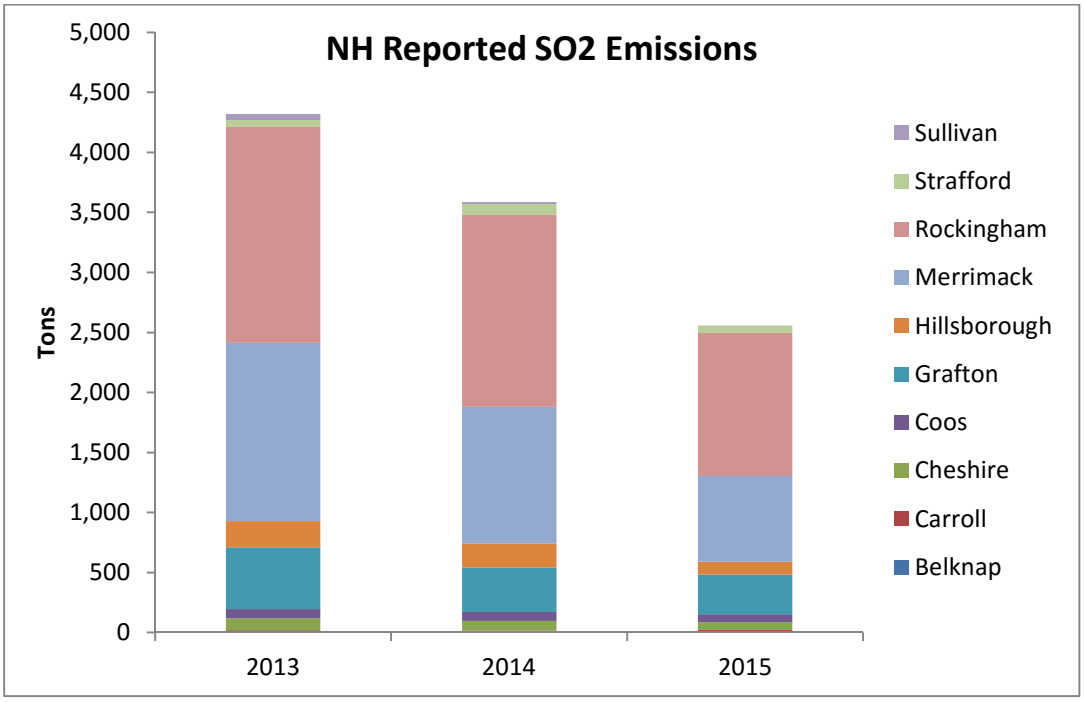
	2013	2014	2015
Belknap	**6.2**	**3.6**	**12.0**
TILTON SCHOOL	0.0	3.3	11.7
Carroll	**14.3**	**13.8**	**9.4**
Cheshire	**99.1**	**79.6**	**64.2**
CHESHIRE MEDICAL CENTER	13.8	9.3	0.2
KEENE STATE COLLEGE	30.9	33.1	34.0

[4] Modeled background sources had a negligible contribution at the locations where these maximum concentrations were predicted.
[5] Ibid.

	2013	2014	2015
MARKEM CORPORATION	17.6	5.8	5.8
THE CHESHIRE MEDICAL CENTER	13.8	9.3	0.2
Coos	**75.5**	**74.1**	**66.2**
BURGESS BIOPOWER LLC	1.6	11.5	14.6
FRASER NH LLC	28.8	29.4	26.2
MOUNT CARBERRY LANDFILL	20.1	13.1	6.6
MOUNT WASHINGTON HOTEL	15.5	14.2	14.4
Grafton	**514.2**	**370.5**	**331.1**
DARTMOUTH COLLEGE	241.7	245.6	241.1
DARTMOUTH-HITCHCOCK MEDICAL CENTER	124.6	16.7	2.8
FREUDENBERG-NOK GENERAL PARTNERSHIP – BRISTOL	34.1	23.3	4.1
NORTH COUNTRY ENVIRONMENTAL SERVICES INC	42.9	33.1	50.2
PLYMOUTH STATE UNIVERSITY	28.1	15.2	0.6
UNIFIRST CORPORATION	12.2	11.1	12.4
Hillsborough	**220.1**	**201.7**	**107.8**
FOUR HILLS LANDFILL	14.4	11.1	4.3
MONADNOCK PAPER MILL	156.1	147.9	80.4
NYLON CORPORATION	2.3	13.7	0.0
WARWICK MILLS INC	12.6	5.8	1.1
Merrimack	**1484.8**	**1138.2**	**713.7**
ENVIRONMENTAL SOILS MANAGEMENT INC	9.8	16.0	10.9
PSNH - MERRIMACK STATION	1401.4	1044.0	636.0
WHEELABRATOR CONCORD COMPANY LP	52.2	56.6	50.9
Rockingham	**1797.4**	**1597.8**	**1191.8**
GRANITE RIDGE ENERGY LLC	7.7	7.8	10.1
NEW NGC d/b/a NATIONAL GYPSUM COMPANY	15.3	16.0	17.0
PSNH - NEWINGTON STATION	330.6	316.1	294.8
PSNH - SCHILLER STATION	1428.1	1243.2	856.8
Strafford	**58.5**	**91.8**	**57.5**
TURNKEY RECYCLING & ENVIRONMENTAL ENTERPRISES	31.7	56.3	30.4
UNIVERSITY OF NEW HAMPSHIRE – DURHAM	12.7	18.7	15.7
Sullivan	**49.5**	**16.2**	**4.7**
APC PAPER COMPANY	30.3	13.6	2.1
WHEELABRATOR CLAREMONT COMPANY LP	17.0	0.0	0.0
Total	**4319.5**	**3587.3**	**2558.6**

In general, emissions of SO_2 from point sources have been declining in recent years. As shown in Figure 2, SO_2 emissions from sources reporting to NHDES declined 40% between 2013 and 2015.

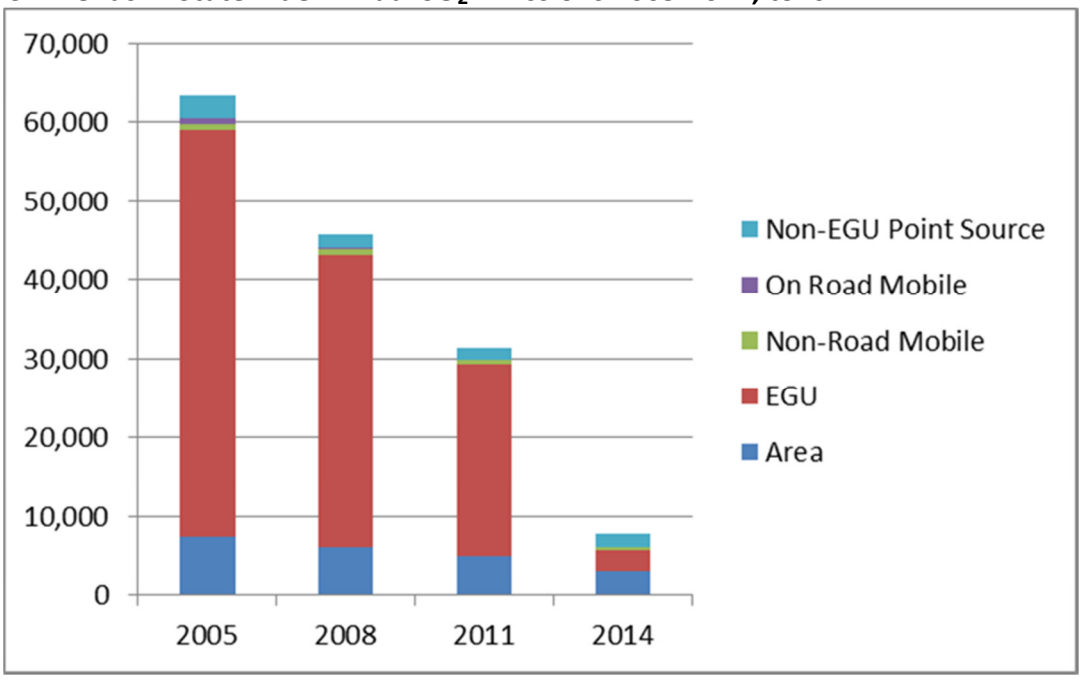
Figure 2. Reported SO_2 Emissions from Permitted Sources, 2013-2015



Statewide SO_2 emissions in general have been declining also, as evidenced in National Emission Inventory reporting for 2005-2014 (Figure 3). Specifically:

- Area sources of SO_2, characterized by residential fuel consumption, have declined 58% since 2008. Beginning July 2018, fuel sold in New Hampshire will be required to have reduced sulfur content – 0.0015 percent for No. 2 fuel oil, 0.25 percent for No. 4 fuel oil and 0.5 percent for Nos. 5 or 6 fuel oil. Any growth in the use of residential fuel oil is expected to be offset by fuel sulfur content limits. These changes will be incorporated into Env-A 1600: *Fuel Specifications* later this year.
- Non-EGU point source emissions have decreased 47%. As with area sources, growth is expected to be offset by fuel sulfur content limits.
- Decreases in SO_2 emissions from nonroad mobile sources (69%) may be attributed to tightening of heavy-duty emission standards and accompanying use of ultra-low sulfur diesel (ULSD).
- Gradual decline in SO_2 emissions from the on-road mobile sector (81%) is likely due to increased fuel efficiency. These reductions are expected to stabilize as the fleet turns over, then may be impacted by changes – increases or decreases – in vehicle miles travelled (VMT).

Figure 3. Trends in Statewide Annual SO_2 Emissions 2005-2014, tons.[6]



AIR QUALITY IN NEIGHBORING STATES

Since SO_2 will most likely either disperse in the atmosphere or chemically react to form a secondary pollutant within a few miles of the source, only large pollutant sources in proximity to the state boundary would be expected to significantly contribute to or interfere with air quality in adjacent states.

According to the EPA's Green Book[7], there are no nonattainment areas or maintenance areas in states surrounding New Hampshire (Massachusetts, Maine, Vermont) for the 1971 or 2010 SO_2 NAAQS. In addition, air monitoring stations throughout these adjacent states indicated 2013-2015 design values well below the 2010 NAAQS (Table 2).[8] Two of these monitors are in counties adjacent to New Hampshire (York County, ME and Worcester County, MA).

Table 5. SO_2 Annual 99th Percentile ($P_{0.99}$) and Design Values (ppb) in surrounding states: 2013 -2015

State	County	City	2013	2014	2015	Design Value
MA	Bristol	Fall River	62	13	10	28.3
MA	Hampden	Springfield	11	7	5	7.7
MA	Hampshire	Ware	6	5	5	5.3
MA	Suffolk	Boston (Kenmore Sq.)	12	10	6	9.3

[6] https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei
[7] https://www.epa.gov/green-book
[8] https://www.epa.gov/outdoor-air-quality-data

State	County	City	2013	2014	2015	Design Value
MA	Suffolk	Boston (Harrison Ave.)	11	12	9	10.7
MA	Worcester	Worcester	8	9	5	7.3
ME	Aroostook	Presque Isle	3	3	3	3.0
ME	Cumberland	Portland	12	11	13	12.0
ME	Hancock	Not in a City	2	2	2	2.0
ME	Kennebec	Gardiner	14	11	11	12.0
ME	York	South Eliot		26	27	26.5*
VT	Chittenden	Underhill	3	3	3	3.0
VT	Rutland	Rutland	10	14	2	8.7
**incomplete data*						

The air quality modeling discussed earlier resulted in a five-year averaged 4th highest daily maximum SO_2 concentration of 74.8 ppb (Table 3). This maximum impact was predicted at a receptor location in Eliot, ME. This result is only slightly below the level of the NAAQS, however this is intentional since the modeling was specifically designed to find the "critical emission rate," that is, the level of emissions that would just meet the standard. The modeled critical emission rate was used to set an enforceable permit condition for Eversource Schiller Station that would protect the 1-hour SO_2 NAAQS in New Hampshire and in neighboring states.

The modeling for Eversource Schiller Station was conducted in accordance with an approved protocol[9] and included a conservative characterization of modeled and monitored background SO_2. The enforceable permit condition that resulted from this conservative modeling analysis allows the two coal units at Schiller Station (i.e. units SR4 and SR6) to emit approximately 4,100 tons per year while still maintaining protection of the NAAQS. As shown in Table 4, Schiller Station has emitted far less than this amount in recent years. The modeling analysis and resulting enforceable permit condition, as well as recent actual emissions data, demonstrate that Schiller Station and other SO_2 sources in the area will not interfere with attainment or maintenance of the NAAQS in Maine.

The receptor grid used in the Schiller Station modeling extended into parts of northeastern Massachusetts. The highest predicted 1-hour SO_2 concentration in this area was approximately 24 ppb, which includes modeled and monitored background contributions. This result is well below the 1-hour SO_2 NAAQS (24 vs. 75 ppb) and demonstrates that Schiller Station and other SO_2 sources in the area will not interfere with attainment or maintenance of the NAAQS in Massachusetts.

NH SO_2 CONTROL PROGRAMS

Chief among the state control measures for attainment of the 2010 SO_2 NAAQS is the requirement for the installation and operation of a flue gas desulfurization system for Eversource

[9] *Technical Memorandum, Air Quality Modeling Protocol for Schiller Station*, March 21, 2016, approved by EPA Region 1 on May 2, 2016.

Merrimack Station located in Bow, NH. The FGD system has its origins in RSA 125-O, *Multiple Pollutant Reduction Program*, which requires the reduction of mercury emissions by at least 80 percent on an annual basis from the baseline mercury input from all affected sources beginning in July of 2013. The removal of most SO_2 emissions at Merrimack Station occurs as a co-benefit of FGD for mercury control.

More specifically, RSA 125-O sets limits on the aggregate mercury emissions from Merrimack and Schiller Stations. Sections 1 and 3 of this statute, requiring an integrated, multi-pollutant reduction strategy for certain power plants, were submitted to EPA on September 13, 2013, as part of New Hampshire's infrastructure SIP for the 2010 SO_2 NAAQS.

Other provisions of New Hampshire's SIP are relevant to the SO_2 nonattainment area control strategy. These include, but are not limited to, the following administrative rules:

- Env-A 600: Statewide Permit System[10]

NHDES regulates and limits air emissions from a variety of sources through a statewide permitting program. Env-A 600 outlines the permitting process and lists sources that require permits for air emissions, either by overall source, specific device, or by pollutant. In order to limit SO_2 from electricity generating units, specified permit conditions were established for: Eversource Merrimack Station in Temporary Permit TP-0189 (September 1, 2016), Newington Station in Temporary Permit TP-0197 (December 22, 2016) and for Eversource Schiller Station Title V renewal permit, TV-0053 (June 15, 2017). Results of the modeling that was used to establish federally enforceable emission limits were presented to EPA by NHDES in its nonattainment plan submission[11] for Merrimack Station, and the data requirements rule submission[12] for Newington and Schiller Stations.

- Env-A 800: Testing and Monitoring Procedures[13]

Env-A 800, effective October 31, 2010, establishes minimum testing and monitoring procedures, calculation procedures, standards, and requirements in order to determine compliance with applicable state and federal statutes and rules.

- Env-A 900: Owner or Operator Recordkeeping and Reporting Obligations[14]

Env-A 900 sets forth requirements for the owner or operator of sources that discharge air pollutants to maintain records so that the emissions of such pollutants can be readily calculated or estimated and reported to the department for the purposes of demonstrating compliance, compiling emission inventories, and developing air-related strategic plans.

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[10] NH amended Env-A 600: Statewide Permit Systems, effective September 1, 2012. NHDES submitted the amended rule, including updates to Env-A 618, 619, as a SIP revision for EPA's approval on November 15, 2012. NH received conditional approval of Env-A 618 and 619 on September 9, 2015.

[11] Central New Hampshire Nonattainment Area Plan for the 2010 Primary 1-Hour Sulfur Dioxide NAAQS, January 20, 2017

[12] Designation of Attainment/Attainment-Unclassifiable for the 2010 SO_2 NAAQS for portions of New Hampshire submitted January 3, 2017.

[13] Env-A 800: Testing and Monitoring Procedures was submitted to the SIP on March 31, 2011. A previous version had been approved by EPA on November 5, 2012.

[14] Env-A 900: Owner or Operator Recordkeeping and Reporting Obligations was submitted as a SIP amendment on July 6, 2012. It was approved by EPA on November 5, 2012.

- Env-A 1600: Fuel Specifications[15]

In accordance with RSA CHAPTER 125-C:10-d, fuel oil sold in New Hampshire, beginning July 2018, may not exceed the following sulfur content: No. 2 fuel oil – 0.0015 percent, No. 4 fuel oil – 0.25 percent, and Nos. 5 or 6 fuel oil – 0.5 percent. These changes will be incorporated into Env-A 1600: *Fuel Specifications* later this year.

- Env-A 2300: Mitigation of Regional Haze[16]

EPA approved New Hampshire's December 16, 2014 Regional Haze 5-Year Progress report as meeting the requirements of 40 CFR 51.308(g) and (h) in 2016 [81 FR 70360].

SUMMARY

Considering this information, New Hampshire certifies that it does not contribute to nonattainment, nor interfere with maintenance of the 2010 1-hr SO_2 NAAQS in neighboring states and therefore meets the "Good Neighbor" provision of section (D)(i)(I).

The submittal of this document to the EPA as an amendment to the New Hampshire SIP fulfills the "Good Neighbor" Provision requirements in Section 110(a)(2)(D)(i)(I) of the CAA and completes New Hampshire's fulfillment of the elements specified in Sections 110(a) (1) and (2) of the CAA for the 2010 1-hr SO_2 NAAQS. In accordance with New Hampshire Code of Administrative Rules Env-A 204.01(b) and Title 40 of the Code of Federal Regulations (CFR) Section 51.102, public notice was given that NHDES prepared and intended to submit to the EPA a revision to the state's SIP to meet the requirements of CAA section 110(a)(2)(D)(i)(I). The notice solicited comments and offered the public the opportunity to participate in a public hearing on the SIP revision. The public hearing was held on May 16, 2017 and written comments were accepted until 4 PM on the same day.

[15] NH adopted Env-A 1600: Fuel Specifications (formerly numbered Env-A 400), effective December 24, 1990. EPA approved this rule into the SIP. NHDES subsequently submitted and withdrew version of the rule in 2003 and 2005. NH is again readopting this rule which will include the SO_2 fuel limits described in this document.

[16] NH adopted revisions to Env-A 2300: Mitigation of Regional Haze on the same date as the 5-Year Progress Report, November 14, 2016.